I. AMENDMENTS

Amendments to the Specification

Please amend the Specification as follows:

Please amend the second full paragraph on page 1, beginning on line 9 and ending on line 14 as follows:

An increase in the transmission capacity because of recent remarkable development of the Internet has stimulated quick spreading of the optical communications network technique ~~of~~ WDM (Wavelength Division Multiplex). WDM multiplies lights of different wavelengths and simultaneously transmits a plurality of multiplied signals over a single optical fiber.

Please amend the fourth full paragraph on page 1, beginning on line 19 and ending on line 27 as follows:

The amplified signal from the optical amplifier is at a high level. If a fault occurs in the optical fiber transmission line or the optical transmission device, the optical signal may be emitted in the air. This situation is dangerous. For example, the dangerous situation will occur when the optical fiber cable is disconnected or pulled off from a unit. In order to ~~have the~~ prevent a maintenance person ~~affected~~ from being injured by the fault, the optical output is automatically ~~broken down~~ stopped when a fault occurs.

Please amend the first full paragraph on page 1, beginning on line 1 and ending on line 8, as follows:

FIG. 15 is a block diagram of an outline of a repeater station provided in a conventional WDM system. A WDM system 200 has repeater stations 210 and 220, which are coupled through optical fiber transmission lines L1 and L2. The repeater station 210 includes optical amplifiers 212a and 212b, optical couplers C1a and C1b, and a supervisory part 211. Similarly, the repeater station 220 includes optical amplifiers 222a, 222b, optical couplers C2a and ~~c2b~~C2b

Please amend the third full paragraph on page 3, beginning on line 10 and ending on line 11 as follows:

In step S100, a fault occurs in the optical fiber transmission ~~lien~~line L1, which is disconnected.

Please amend the second full paragraph on page 4, beginning on line 11 and ending on

line 17 as follows:

In order to avoid such a situation, both the up and down optical fiber transmission lines are subjected to the light cutoff control even if only one of them becomes faulty. In the above-mentioned example, the OSC signal travels over the optical fiber transmission line L2. However, the OSC signal is at a comparatively low level and no dangerous situation may occur even if the optical fiber transmission line L2 is broken.

Please amend the paragraph beginning on page 4, line 27 and ending on page 5, line 4 as follows:

That is, the practical bidirectional transmission network has different traffics in the up and down directions. ~~The breaking~~ Breaking the channels having high traffic in response to disconnection of the channels having low traffic would degrade work efficiency and service quality.

Please amend the paragraph beginning on page 5, line 24 and ending on page 6, line 4 as follows:

The above objects of the present invention are achieved by a transmission system performing optical transmission ~~comprising~~ including: a repeater on a sending side including an optical amplifier amplifying an optical main signal, and a fault occurrence recognizing part detecting a pump light used for an opposing device via an optical fiber transmission line to which an optical main signal is sent by the repeater; and another repeater on a receiving side sending the pump light.

Please amend the first full paragraph beginning on page 6, line 5 and ending on line 13 as follows:

The above objects of the present invention are also achieved by a repeater performing an optical relay transmission ~~comprising~~ including: an optical amplifier amplifying an optical main signal by using a pump light; and a fault occurrence recognizing part that receives the pump light used in an opposing device via an optical fiber transmission line to which an optical main signal is sent by the repeater and recognizes occurrence of a fault, if the fault occurrence recognizing part fails to receive the pump light.

Please amend the fourth full paragraph on page 8 beginning on line 17 and ending on line 26 as follows:

The optical amplifier 11 of the repeater on the sending side amplifies the main signal. A fault occurrence recognizing part 12 performs a control of detecting a pump light used in the other device (repeater 20 on the receiving side) via an optical fiber transmission line L to which the optical main signal is sent from its own device (repeater 10 on the sending side), and recognizes occurrence of a fault if the pump light is detected. ~~An~~ A light cutoff control part 13 stops the optical amplifier 11 outputting the optical signal when a fault occurs, so that a one-way light cutoff control can be performed.

Please amend the first full paragraph on page 11 beginning on line 4 and ending on line 12 as follows:

Next, a description will now be given of the distinctions between the present invention and the prior art disclosed in Japanese Unexamined Patent Publication No. 05-284110. For the light cutoff control, the present invention detects the pump light that is sent to the opposite direction to that in which the main signal is sent over the same optical fiber transmission line~~, while related art is disclosed in Japanese Unexamined Patent Publication No. 05-284110~~.

Please amend the second full paragraph on page 11 beginning on line 13 and ending on line 20 as follows:

FIG. 4 is a diagram of a prior art structure of Japanese Unexamined Patent Application No. 05-284110. Repeater stations 301 and 302 are connected via an optical fiber transmission line L3. The repeater station 301 includes an optical amplifier 301a, a Brillouin amplifier part 301b, and a supervisory signal detecting part 301c. The repeater station 302 includes an optical amplifier 302a and a supervisory signal light source 302b (an optical coupler is omitted).

Please amend the third full paragraph on page 12 beginning on line 19 and ending on line 25 as follows:

Conventionally, a separate light source for the supervisory signal is provided to carry out the light cutoff control. Further, a Brillouin amplifying part is provided specifically for amplifying the supervisory signal. This ~~needs~~ conventional system requires functions that ~~should be newly provided~~ must be added to ~~the existing~~ many optical systems, and may ~~have~~ cause some difficulty in rearrangement of the system configuration and downsizing.

Please amend the third full paragraph on page 13 beginning on line 18 and ending on line 21 as follows:

As to the down transmission line L2, the repeater 30a includes a coupler C6a, a coupler C7a, an optical amplifier 39a, couplers C8a, C9a and C10a, a Raman amplifier 38a, a filter 37a, and a spectrum detector 36a.

Please amend the first full paragraph on page 14 beginning on line 4 and ending on line 7 as follows:

~~An~~ A normal operation ~~in normal working~~ is described below, in which only the operation involved in the up transmission line L1 is described because the operation involved in the down line L2 is the same as that in the up direction.

Please amend the second full paragraph on page 14 beginning on line 8 and ending on line 15 as follows:

In step S11, a main signal after passing through the couplers C4a and C5a and being amplified by the optical amplifier 31a and passing through the coupler C1a ~~are~~ is combined, by the coupler C2a, with an OSC signal which is a light control signal from the supervisory control part 32a. The above combining results in a multiplexed light signal, which passes through the coupler C3a and is sent to the repeater 30b via the transmission line L1.

Please amend the first full paragraph on page 15 beginning on line 6 and ending on line 14 as follows:

In step S14, Raman pump light is picked up by the coupler C3a, and is filtered by the filter 34a. Then, the filtered Raman pump light is output to the spectrum detector 35a. Since the Raman pump light is at an extremely high level, the remaining component of the pump light may reach the repeater 30a. The filter 34a ~~cutoffs~~ cuts off lights having wavelengths of 1500 nm or higher in order to prevent the main signal from being returned due to reflection at a connector end surface (return light).

Please amend the second full paragraph on page 15 beginning on line 15 and ending on line 25 as follows:

In step S15, the spectrum detector 35a detects the spectrum of the pump light received from the filter 34a, and sends the detection result to the supervisory control part 32a. Then, the supervisory control part 32a recognizes the spectrum detected as the normal ~~receiving from the detection result~~ operating spectrum. The spectrum detector 35a detects the spectrum of the output signal from the optical amplifier 31a split by the coupler C1a (the detection target is periodically switched), and supplies the detection result to the supervisory control part 32a (that is, the supervisory control part 32a monitors the output from the optical amplifier 31a also).

Please amend the first full paragraph on page 16 beginning on line 3 and ending on line 4 as follows:

In step S21, a fault occurs in the optical fiber transmission ~~lien~~line L1 so that it is disconnected.

Please amend the fourth full paragraph on page 16 beginning on line 14 and ending on line 19 as follow:

Another embodiment is described below. FIG. 7 shows a configuration of the transmission system. Repeaters 40a and 40b (referred to as repeaters 40 generally) are connected by the optical fiber transmission lines L1 and L2. The repeaters 40 include an optical amplifier, a supervisory control part and a coupler.

Please amend the paragraph beginning on page 16, line 27 and ending on page 17, line 3 as follows:

Similarly, the repeater 40b includes a supervisory ~~monitor~~ control part 42b, and has, as to the up transmission line L1, a coupler C13b, a coupler C14b, an optical amplifier 41b, and couplers C11b and C12b.

Please amend the paragraph beginning on page 17, line 26 and ending on page 18, line 2 as follows:

~~An~~ A normal operation ~~in normal working~~ is described in which only the operation involved in the up transmission line L1 is described because the operation involved in the down line L2 is the same as that in the up direction.

Please amend the first full paragraph on page 18 beginning on line 3 and ending on line 9 as follows:

In step S31, a main signal after passing through the couplers C13a and C14a and being amplified by the optical amplifier 41a ~~are~~ is combined, by the coupler C11a, with the OSC signal Aosc which is a light control signal from the supervisory control part 42a. The above combining results in a multiplexed light signal, which passes through the coupler C12a and is sent to the repeater 40b via the transmission line L1.

Please amend the paragraph beginning on page 19 line 26 and ending on page 20, line 4 as follows:

Also, in the above case, the optical supervisory signal (λn) is always output. Alternatively, the light cutoff control can be implemented by generating a light pulse of the wavelengthλn (a pilot tone signal) and periodically sending the pulse in the opposite direction to the flow of the optical main signal.

Please amend the second full paragraph on page 21 beginning on line 13 and ending on line 16 as follows:

~~An~~ A normal operation ~~in normal working~~ is described in which only the operation involved in the up transmission line L1 is described because the operation involved in the down line L2 is the same as that in the up direction.

Please amend the third full paragraph on page 21 beginning on line 17 and ending on line 27 as follows:

In step S51, the main signal after passing through the couplers C13a and C14a and being amplified by the optical amplifier 51a ~~are~~ is combined, by the coupler C11a, with the OSC signal Aosc λ1 which is a light control signal from the supervisory control part 52a. The above combining results in a multiplexed light signal, which passes through the coupler C12a and is sent to the repeater 50b via the optical fiber transmission line L1. The multiplexed light signal thus sent is separated by the coupler C14b into parts, which are respectively sent to the optical amplifier 51b and the supervisory control part 52b.

Please amend the second full paragraph on page 22 beginning on line 6 and ending on line 8 as follows:

In step S53, ~~,~~the optical supervisory signal Bosc (λ2) is separated by the coupler C12a into parts and is input to the supervisory control part 52~~5~~a.

Please amend the paragraph beginning on page 22, line 24 and ending on page 23, line 1 as follows:

In step S64, the OSC signal Aosc (λ2) from the repeater 50a and the OSC signal Bosc (λ2) from the repeater 50b are alternately sent and received on the optical fiber transmission ~~lien~~line L2. Even if a disconnection occurs in one of the two directions, bidirectional DCC communication can take place.

Please amend the fifth full paragraph on page 23 beginning on line 22 and ending on line 25 as follows:

As to the down transmission line L2, the repeater 60a includes coupler C8a, C9a and C10a, an optical amplifier 69a, couplers C11a, C12a, C13a and C14a, a Raman amplifier 68a, a filter 67a, and a spectrum detector 66a.

Please amend the fourth full paragraph on page 24 beginning on line 19 and ending on line 25 as follows:

In step S71, a main signal after passing through the couplers C5a, C6a and C7a and being amplified by the optical amplifier 61a ~~are~~ is combined, by the coupler C2a, with the OSC signal which is a light control signal from the supervisory control part 62a. The above combining results in a multiplexed light signal, which passes through the couplers C3a and C4a and is sent to the repeater 60b via the transmission line L1.

Please amend the fourth full paragraph on page 25 beginning on line 14 and ending on line 18 as follows:

In step S75, the spectrum detector 65a detects the spectrum of the pump light received from the filter 64a, and sends the detection result to the supervisory control part 62a. Then, the supervisory control part 62a recognizes the spectrum detected as the normal ~~receiving from the detection result~~ operating spectrum.

Please amend the sixth full paragraph on page 25 beginning on line 23 and ending on

line 24 as follows:

In step S76, a fault occurs in the optical fiber transmission ~~lien~~line L1 so that it is disconnected.

Please amend the second full paragraph on page 26 beginning on line 7 and ending on line 13 as follows:

~~An~~ A normal operation ~~in normal working~~ is described in which only the operation involved in the up transmission line L1 is described because the operation involved in the down line L2 is the same as that in the up direction. The pilot tone signal ~~is sued~~ is used as the optical supervisory signal. FIG. 13 shows a corresponding structure of the transmission system (which is the same as that shown in FIG. 11).

Please amend the third full paragraph on page 26 beginning on line 14 and ending on line 21 as follows:

In step S81, the main signal after passing through the couplers C5a, C6a and C7a, being amplified by the optical amplifier 61a and passing through the coupler C1a ~~are~~ is combined, by the coupler C2a, with the OSC signal (its wavelength is λ1) which is a light control signal from the supervisory control part 62a. The above combining results in a multiplexed light signal, which passes through the couplers C3a and C4a and is sent to the repeater 60b via the transmission line L1.

Please amend the paragraph beginning on page 26, line 27 and ending on page 27 line 2 as follows:

In step S83, the pilot tone signal after passing through the coupler C4a is picked up by ~~he~~ the coupler C3a, and is input to the supervisory control part 62a.